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NEW POLYFLUORINATED LIGANDS BASED ON 2,2'-BYPYRIDINES AND 1,2,4TRIAZINES IN THE DESIGN OF MANGANESE AND COPPER METAL COMPLEXES

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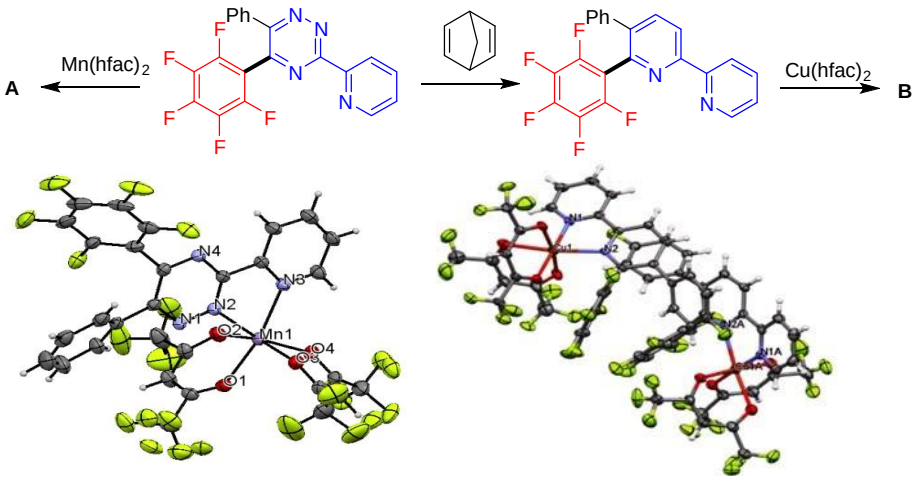
Abstract. Polycyclic nitrogen-containing ligand systems based on 2,2'-bipyridines and 1,2,4-triazines show the increased interest in coordination and supramolecular chemistry. According to the literature, an introduction of fluorine atoms or fluorine-containing groups in organic molecules is known to lead to significant changes in the physical and chemical characteristics of the fluorinated substances in comparison with their non-fluorinated analogues.

To obtain 6-(pentafluorophenyl)-5-phenyl-2,2'-bipyridine, the Aza-Diels-alder reaction of 5(pentafluorophenyl)-6-phenyl-3-(pyridyl-2-yl)-1,2,4-triazine with 2,5-norbornadiene has been used. Also, the complexing properties of synthesized pentafluorophenyl bidentate ligands based on 2,2'-bipyridine and 1,2,4-triazine with manganese (II) and copper (II) hexafluoroacetylacetonates have been evaluated. The structure of the synthesized metal complexes was confirmed by X-ray structual analysis.



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Scheme 1. Synthesis of manganese and copper complexes based on polyfluorinated 2,2'-bipyridyl and 1,2,4-triazines

In conclusion, an effective synthetic strategy of the ligands based on 2,2'-bipyridines and 1,2,4triazine bearing pentafluorophenyl fragment was proposed and the ability to form manganese and copper complexes was studied. The obtained substances demonstrate a particular interest in the field of coordination and supramolecular chemistry.

References

1. Direct C-H/C-Li coupling of 1,2,4-triazines with C_6F_5Li followed by aza-Diels-Alder reaction as a pot, atom, and step economy (PASE) approach towards novel fluorinated 2,2′-bipyridine fluorophore / T.D. Moseev, M.V. Varaksin, D.A. Gorlov, E.A. Nikiforov [et al.] // J. Fluorine Chem. – 2019. – Vol. 224. – P. 89-99.

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